IS 13630-7 (2006): Ceramic Tiles - Methods of test, Part 7: Determination of chemical resistance - Unglazed tiles(see IS 13630 : Parts 1 to 15) [CED 5: Flooring, Wall Finishing and Roofing]

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भारतीय मानक

सिरैमिक टाईलें - परीक्षण पद्धतियाँ, नमूने लेने तथा स्वीकार्यता का आधार

(पहला पुनरीक्षण)

Indian Standard

CERAMIC TILES — METHODS OF TEST, SAMPLING AND BASIS FOR ACCEPTANCE

(First Revision)

ICS 91.100.23

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

August 2006 Price Group 1

FOREWORD

This Indian Standard (Parts 1 to 15) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Flooring, Wall Finishing and Roofing Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in various parts in 1992-93. This is the first revision; having all parts combined in one publication, of the standard in which the following major changes have been incorporated:

a) As per the decision taken in the last meeting, the requirements of all the parts have been included in one volume and the revised standard has been brought in line with ISO 10545 (various parts).
b) The requirements for determination of bulk density have been added in Part 2 and a few changes have been made in the requirements for determination of water absorption.
c) A few modifications have also been made in Part 3.
d) Requirements for determination of breaking strength have also been added in Part 6.
e) Requirements for determination of glazing resistance tests have also been modified in Part 9.
f) A new test for determination of impact resistance by measurement of co-efficient of restitution has been added as Part 14.
g) IS 13711 : 1993 'Sampling and basis for acceptance' has been amalgamated with Part 15 of this standard.

In formulation of this standard considerable assistance have been derived from the following standards:

ISO 10545-1 : 1995 Ceramic tiles — Part 1 : Sampling and basis for acceptance
ISO 10545-2 : 1995 Ceramic tiles — Part 2 : Determination of dimensions and surface quality
ISO 10545-3 : 1995 Ceramic tiles — Part 3 : Determination of water absorption, apparent porosity, apparent relative density and bulk density
ISO 10545-4 : 2004 Ceramic tiles — Part 4 : Determination of modulus of rupture and breaking strength
ISO 10545-5 : 1996 Ceramic tiles — Part 5 : Determination of impact resistance by measurement of coefficient of restitution
ISO 10545-6 : 1995 Ceramic tiles — Part 6 : Determination of resistance to deep abrasion for unglazed tiles
ISO 10545-7 : 1996 Ceramic tiles — Part 7 : Determination of resistance to surface abrasion for glazed tiles
ISO 10545-8 : 1994 Ceramic tiles — Part 8 : Determination of linear thermal expansion
ISO 10545-9 : 2004 Ceramic tiles — Part 9 : Determination of resistance to thermal shock
ISO 10545-10 : 1995 Ceramic tiles — Part 10 : Determination of moisture expansion
ISO 10545-11 : 1994 Ceramic tiles — Part 11 : Determination of crazing resistance for glazed tiles
ISO 10545-12 : 1995 Ceramic tiles — Part 12 : Determination of frost resistance
ISO 10545-13 : 1995 Ceramic tiles — Part 13 : Determination of chemical resistance
ISO 10545-14 : 1995 Ceramic tiles — Part 14 : Determination of resistance to stains
ISO 13006 : 1998 Ceramic tiles — Definitions, classification, characteristics and marking

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CERAMIC TILES — METHODS OF TEST, SAMPLING AND BASIS FOR ACCEPTANCE

PART 7 DETERMINATION OF CHEMICAL RESISTANCE — UNGLAZED TILES

(First Revision)

1 SCOPE

This standard (Part 7) covers a method of test for determining the chemical resistance of the proper surface of all unglazed ceramic tiles.

2 REFERENCE

The standard listed below is necessary adjunct to this standard:

IS No.	*Title*
2303 : 1994	Method of grading glass for alkalinity (*first revision*)

3 PRINCIPLE

The test specimens are partially immersed in the test solution and attack is determined visually after 28 days.

4 AQUEOUS TEST SOLUTIONS

4.1 Household Chemicals

a) *Ammonium Chloride Solution*, 100 g/l.

b) Standard cleaning agent solution prepared from:

1)	Anhydrous sodium carbonate	33 percent (*m/m*)
2)	Sodium perborate	7 percent (*m/m*)
3)	Sodium silicate solution of density 1.33 g/cm^3	7 percent (*m/m*)
4)	Commercial sodium oleate soap flakes	30 percent (*m/m*)
5)	Distilled water or de-ionized water	23 percent (*m/m*)

NOTE — The soap can be prepared from concentrated sodium hydroxide solution and oleic acid in the proportions of 2.6 g to 18.5 g respectively.

c) 100 g of this standard cleaning agent contain 70 g of dry substance. Use in a concentration of 10 g dry substance per litre. The test solution shall be prepared immediately before use.

4.2 Swimming Pool Salts

a) Sodium hypochlorite solution 20 mg/l, prepared from technical grade hypochlorite with about 13 percent active chlorine, and

b) Copper sulphate solution, 20 mg/l.

4.3 Acids

a) Sulphuric acid solution, 70 percent (*v/v*) prepared from concentrated sulphuric acid ($d \simeq 1.84$). Cautiously add the sulphuric acid to water, cooling the solution and keeping it well mixed during addition.

b) Lactic acid solution 5 percent (*v/v*) (available in this concentration).

4.4 Alkali

Potassium hydroxide solution 200 g/l.

5 APPARATUS

5.1 Vessel — With a lid, made of borosilicate glass 3.3 conforming to Type 1 when graded according to IS 2303 or any other suitable material.

5.2 Drying Oven — Capable of operation at 110 ± 5°C.

5.3 Chamois Leather

5.4 Balance — Accurate to 0.05 g

6 TEST SPECIMENS

6.1 Number of Test Specimens

Five test specimens shall be used with each test solution.

6.2 Size of Test Specimens

A square test specimen 50 mm × 50 mm shall be cut from each tile under test in such a manner that one side of each test specimen is not a cut side.

6.3 Preparation of Test Specimens

Thoroughly clean the proper surface with a suitable solvent, for example, methanol. Test specimens with surface defects shall be excluded from the test.

7 PROCEDURE

7.1 Dry the test specimens at 110 ± 5°C until they reach to constant mass when the difference between the successive weighing is less than 0.1 g, and cool to room temperature.

7.2 Immerse the test specimens vertically to a depth of 25 mm in the test solution (which may be any of those listed in 4) in the test vessel. The non-cut side of each test specimen shall be fully immersed. Cover with the lid and maintain the test assembly for 28 days at 27 ± 2°C.

7.3 After 28 days subject the test specimens to running water for 7 days and then boil them for ½ h while completely immersed in water. Remove the test specimens from the water and dab with wet but wrung out chamois leather.

7.4 Examine the test specimen with naked eye, with spectacles usually worn, for changes on the proper surface and the non-cut edge. Secondarily examine the parts of the cut edges that were immersed.

8 TEST REPORT

The test report shall contain the following:

a) Description of the tile;
b) Test solution(s) used;
c) Number of test specimens;
d) Number of test specimens damaged by each test solutions;
e) Visual changes on the proper surface as a result of the test specified in 7;
f) Visual changes on the non-cut edges as a result of the test specified in 7; and
g) Visual changes on the cut-edges as a result of the test specified in 7.

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This Indian Standard has been developed from Doc: No. **CED 5 (7358 to 7372).**

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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